

REMARKS

In the Office Action, the Examiner rejected claims 1-21 under 112, claim 1 under 35 USC 102 and claims 2-21 under 35 USC 103. These rejections are fully traversed below.

Claims 1, 4-6, 16 and 17 have been amended. Claims 2, 3 and 20 have been cancelled. Claims 22-27 have been added. Thus, claims 1, 4-19 and 21-27 are pending in the application. Reconsideration of the application is respectfully requested based on the following remarks.

Drawings

The drawings are objected to because the cross hatching does not conform to the guidelines as set out in MPEP 608.02. In particular, the cross-hatching of the insulative portions of the assembly should be cross hatched with alternating thick and thin diagonal lines.

The drawings where appropriate have been corrected using alternating cross hatching as indicated by the Examiner. See replacement sheets of Figs. 4A and 4B as well as Figs. 5A and 5B attached herewith. Accordingly, the objection should be withdrawn.

Claim Rejections - 35 USC 112

Claims 1-21 have been rejected under 35 U.S.C 112, first paragraph, as failing to comply with the enablement requirement.

The Applicant respectfully disagrees. As shown in Fig. 5A, the contact pads 226 are coupled to the PCB 308 via wires or other conductors (no reference number, shown by dark line) embedded in the insulating member 222A, and the outer electrode is coupled to the PCB via legs or posts (no reference number) that extend out the bottom of the outer conductive shell 210. Furthermore, contact pads 230 are coupled to the plug 204 via wires or other conductors (no reference number, shown by dark line) embedded in the insulating member 222B.

In addition, the specification is replete with examples of structural details. For example, as stated on page 20, lines 8-12, "the posts 270 may serve as structural members as well as a means for providing electrical connection to the internal components positioned in the housing as

for example a printed circuit board (PCB). The posts of the inner electrode 212 may be a portion of the insulating member 222A. As such, the post may include a wire embedded therein for connecting the contact pads to the PCB." Also on page 20, lines 20-25, "The contacts 224A are formed by upper and lower contact pads 226 positioned in grooves 228 of the insulating member 222A...The contacts 224B are formed by upper and lower contact pads 230 positioned on rails 232 of the insulating member 222B." Further, as stated on pages 20 and 21, "The connection to the PCB allows the electrode contacts 224 to electrically couple to various circuit components as for example a power management circuit."

Further still, as recited on page 16, lines 14-16 "Each set of contact pads (upper/lower) is connected to a separate terminal or post, each of which is capable of being electrically connected to a PCB," and on lines 25-27, "Each set of contact pads (upper/lower) is connected to a separate wire, each of which is capable of being electrically connected to power cables, converters or sources."

Moreover, as stated on page 22, lines 2-6, "The insulating members are typically injection molded parts. Once molded, the contact pads can be positioned thereon. Alternatively, the contact pads and wires associated therewith are molded with the insulating member such that they are embedded in the insulating member. The insulating member is typically press fit into the outer conductive shells."

Based on the above, the invention is fully enabled to one skilled in the art. It should be noted, however, that these are not limiting as there are alterations, permutations and equivalents, which still fall within the scope of the invention.

In any event, at least some of the concerns of the Examiner seem trivial as the structural details are hardly necessary and are well within the range of the skills of one with ordinary skills in the art. For example, in response to the Examiners question "how are the wires attached" even those not skilled in the art would understand how to attach wires to a printed circuit board (e.g., solder, leads, connector, etc).

Accordingly, the rejection should be withdrawn.

Claims 3-6 have been rejected under 35 U.S.C 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The rejection has been overcome by the amendments made above.

Claim Rejections – 35 USC 102

Claim 1 has been rejected under 35 U.S.C. 102(b) as being anticipated by *Davis* (5,785, 557).

In contrast to *Davis*, claim 1 specifically requires, "...the inner electrode having redundant power contacts that are electrically isolated within the same plane..." While *Davis* discloses power contact 6 and fingers 9, it is unclear whether these are redundant as required by the claims. As exemplified in the specification of the present invention, by redundant it is generally meant that the contacts perform the same function. Accordingly, the rejection is unsupported by the art and should be withdrawn.

Also in contrast to *Davis*, claim 1 specifically requires, "...the outer shell and inner electrode being configured for 0/180 degree connection with a second outer shell and second inner electrode of a second DC connector along a mating axis..." In *Davis*, the profile of the mating end includes chamfers 35 thereby limiting the connection to one position. This is reiterated by the Examiner in the Office Action, "Davis does not show the connectors as being reversible (due to the polarizing feature of the cut corners as seen clearly in figure 2)." In anticipation of a similar argument used for claim 2, the Applicant would like to point out that the use of *Davis* and further the combination of *Davis* and *Eichorn* is improper for several reasons. For example, *Davis* clearly teaches away from the claimed invention, and the teachings of *Eichorn*. *Davis* requires connecting at one position as evidenced by the chamfers 35 and further as stated in Col. , lines 18-21, "The mating end 12 has a profile including chamfers 35. Fig. 2 that intersect the wall 14, making the wall 14 less wide than the wider wall 15, thereby providing the connector 1 with polarity for orienting the mating end 12." Because *Davis* teaches away, the rejection is improper and should be withdrawn.

Also in contrast to *Davis*, claim 1 specifically requires, "...the outer shell and inner electrode of the DC connector having an axial contact distance with the second outer shell and second inner electrode of the second DC connector of less than 5 mm when fully mated so as to minimize the mating force between the DC connectors, and to allow angled insertion and extraction away from the mating axis during the 0/180 connection with the second DC connector..." It appears that *Davis* is completely silent to an axial contact distance of less than 5 mm. In anticipation of a similar argument used for claim 4, the Applicant vehemently disagrees with the Examiner that it would have been obvious to vary the *Davis* axial contact distance as desired and such variations would have been a matter of engineering design choice without patentable significance. As mentioned in the background of the present invention, traditional engineering approaches have used high friction over long distances in order to ensure proper electrical contact and securement between two connectors (see page 2 lines 2-11). The present invention goes in a different direction than these traditional approaches so as to make insertion and extraction easier. The present invention proposes using small axial contact distances to lessen the friction force and allow off angle manipulation of the connector (see Figs. 2A-2C). Engineers simply would not do this for the reason that the connectors would easily disengage as for example when they are bumped, and that they would not achieve the desired electrical contact thereby diminishing their functionality. Going in a different direction than the prior art is simply not a matter of engineering design choice, but rather patentable advancement that is unrecognized by engineers following traditional guidelines. Accordingly, the rejection is improper and should be withdrawn.

Claim Rejections – 35 USC 103

Claim 2 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Davis as in claim 1 in view of *Eichorn et al* (6,530,793).

This claim has been cancelled. Similar limitations have been incorporated into claim 1. See arguments above.

Claims 4-6 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Davis as in claim 3.

See arguments above.

Claims 7-13 and 21 have been rejected under 35 U.S.C. 103(a) as being unpatentable over *Davis* and *Eichorn* as discussed regarding claim 1-6.

As mentioned above, the combination of *Davis* and *Eichorn* is improper and therefore the rejection should be withdrawn. One skilled in the art would simply not be motivated to combine *Davis* and *Eichorn* to come up with the claimed invention since *Davis* clearly teaches away from the invention and *Eichorn* by utilizing chamfers 35 and stating single polarity.

In any event, neither reference teaches or suggests, "...the insertion and receiving elements having a small axial contact distance between about 3 and about 4 mm in order to minimize the insertion extraction force found between the insertion and receiving elements..." as required by claim 21. Accordingly, the rejection is unsupported by the art and should be withdrawn.

Claims 14 and 15 have been rejected under 35 U.S.C. 103(a) as being unpatentable over *Davis* and *Eichorn* as in claim 7 in view of *Arai* (6,482,045).

Claims 16-20 have been rejected under 35 U.S.C. 103(a) as being unpatentable over *Davis*, *Eichorn* and *Arai* as discussed regarding claims 1-15.

The rejections are improper for at least the reasons given above. *Arai* is similar to *Davis* in that *Arai* requires keys and keyways for single position mating (see Figs. 3 and 4). *Arai* states, "...It is another object of this invention to provide a connector socket, a connector plug and a connector assembly which provides for discriminating many type of connectors to prevent connection between wrong type of connectors (Col. 2, lines 37-40)." *Arai* also states, "...and key boss is disposed in the cylindrical groove in opposing relation with the at least one plate surface of the support so as to prevent wrong connection between different type of connector socket and connector plug (Col. Lines 63-67)." In fact, *Arai* deems this feature so important that he even claims it (see claim 1). As should be appreciated, *Arai* like *Davis* teaches away from the present invention and *Eichorn*. Accordingly, the rejections are improper and should be withdrawn.

In any event, none of the references teach or suggest the combination of a holding detent mechanism and one or more contact flexures as required by claim 16. Accordingly, the rejection is unsupported by the art and should be withdrawn.

SUMMARY

Applicant believes that all pending claims are allowable and respectfully requests a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

Respectfully submitted,

BEYER WEAVER & THOMAS, LLP



Quim C. Hoellwarth
Reg. No. 45,738

P.O. Box 778
Berkeley, CA 94704-0778
(650) 961-8300